
DUST PROTOCOL

CANTERBURY SAFETY REBUILD FORUM



SILICA AND DUST MANAGEMENT

The following document has been developed to assist in the review of Silica and Dust Management for businesses that work in construction. It is designed for Persons Conducting a Business or Undertaking (PCBUs), decision makers and Supervisors to look at Silica and Dust management. It is intended that businesses would use the silica and dust risk register as guidance to assist them in assessing the risk and appropriate controls for the work that they are doing within the given tasks.

It is expected that when workers are developing a Task Analysis/SWMS/JSEA they could choose appropriate controls that are reasonably practicable for management of risks and hazards as opposed to implementing all suggested risks and controls.

It is expected that at worker level, Toolbox talks and other forms of communication would be developed to educate all workers in silica and dust management including, but not limited to the appropriate controls.

Construction silica and dust risk management documentation including Task Analysis/SWMS/JSEAs, training and competency registers must be written by the company/contractor undertaking the work. These documents form part of the Site Specific Safety Plan to comply with the minimum standards outlined in regulations, codes of practice and guidance documents.

WorkSafe NZ, Safe Work Australia, Health Safety Executive UK and ECAN BPG guidance documents and factsheets have been referenced at the end of this document.

Other considerations: The risks linked to the dusts involved, other controls needed for these risks, guarding dangerous parts of the equipment, electrical safety and fire or explosions risks, lifting and carrying the equipment, working at height with the equipment, slips and trips from trailing cables, environmental contamination outside of silica and dusts i.e. HAIL sites.

PLEASE NOTE:

The risk rating table provided and used in this register is an example only and is intended to better understand the risks associated with dust in construction. For completeness your business should overlay its own risk rating table to the risk assessment. The information provided in this document must be used in conjunction with a cohesive health and safety Management system. It is not intended for this document to encompass all risk associated with dust and silica or tasks that would be carried out in construction, but rather to provide guidance for 'high risk' tasks where there is a high likelihood and consequence of harm or significant loss. Proposed legislation is likely to require a formal risk assessment to be undertaken in conjunction with task planning and on site management. Principals and/or PCBUs must be aware that under the Act you cannot discharge your duty. Undertaking due diligence to ensure that contractors are suitably trained, competent and able to plan work safely prior to engagement, and monitoring onsite behaviour throughout a project is an essential responsibility in construction safety management.

RISK RATING TABLE				
Likelihood of injury or harm to health	Consequences of injury or harm to health			
	Insignificant <i>no injuries</i>	Moderate <i>first aid and/or medical treatment</i>	Major <i>extensive injuries</i>	Catastrophic <i>fatalities</i>
Very likely	High	Extreme	Extreme	Extreme
Likely	Moderate	High	Extreme	Extreme
Moderate	Low	High	Extreme	Extreme
Unlikely	Low	Moderate	High	Extreme
Highly unlikely (rare)	Low	Moderate	High	High

Extreme = immediate action



1. Dust from: Bricks, Stone and Fibre Cement Products

[Sawing, hammering, sanding, drilling, grinding, chipping concrete or masonry]

Potential Hazards and Harm	Initial Risk	Control Methods (Describe what will be done to control the risk)	Level of Control	Residual Risk
Silicosis COPD (Chronic Obstructive Pulmonary Disease) Lung Cancer Renal Disease Airflow Diseases [1,3,5,8]	High	At design stage redesign the work to limit the use of silica products and the amount of cuts etc. required [7]	2	Medium
		Use non silica product where possible [7]	2	
		Provide a dedicated cutting area [7]	3	
		Enclose the work area where possible to prevent dust escaping [7]	3	
		Limit the number of people near the work [1,7]	3	
		Use a less powerful tool e.g. block splitter instead of a cut off saw [7,8]	4	
		Use hand tools for cuts where possible [7,8]	4	
		Use on-tool extraction; a local exhaust [LEV] system that is fitted directly onto the tool [7,8]	4	
		Rotate the workers doing the task and alternate tasks during the shift [7]	5	
		Provide training on identification of silica dust and how employees can protect themselves [1,4,5,7,8]	5	
		Use water suppression [7,8]	5	
		Provide air monitoring to measure the overall amount of silica dust created on the worksite [1,7]	5	
		Provide health monitoring for all workers exposed to silica dust which may include lung function testing annually and other tests as directed by a health professional e.g. Occupational Health Nurse or Medical Practitioner [1,2,3,5,7]	5	
		USE PPE; fit test all workers with suitable respirator (P2 filter min); goggles, overalls and gloves [1,7,8]	6	

2. Dust from: Demolition

[Concrete and masonry structures]

Potential Hazards and Harm	Initial Risk	Control Methods (Describe what will be done to control the risk)	Level of Control	Residual Risk
Silicosis COPD (Chronic Obstructive Pulmonary Disease) Lung Cancer Renal Disease Airflow Diseases [1,3,5,8]	High	Limit the number of people near the work [1,7]	3	Medium
		Use hand tools for cuts where possible [7,8]	4	
		Use on-tool extraction; a local exhaust [LEV] system that is fitted directly onto the tool [7,8]	4	
		For small 'one off' amounts of dust/debris use a brush and shovel and bucket [7]	4	
		For regular removal/site cleaning; water spray for damping down [7]	4	
		Provide covered chutes and skips where needed [7]	4	
		Provide training on identification of silica dust and how employees can protect themselves [1,4,5,7]	5	
		Use water suppression [7,8]	5	
		Rotate the workers doing the task and alternate tasks during the shift [7]	5	
		Provide air monitoring to measure the overall amount of silica dust created on the worksite [1,7]	5	
		Provide health monitoring for all workers exposed to silica dust which may include lung function testing annually and other tests as directed by a health professional e.g. occupational health nurse or medical practitioner [1,2,3,5,7]	5	
		USE PPE; fit test all workers with suitable respirator (P2 filter min); goggles, overalls and gloves [1,7,8]	6	



3. Dust from: Abrasive Blasting

[Concrete and other materials, especially where sand is used as the abrasive]

Potential Hazards and Harm	Initial Risk	Control Methods (Describe what will be done to control the risk)	Level of Control	Residual Risk
Silicosis COPD (Chronic Obstructive Pulmonary Disease) Lung Cancer Renal Disease Airflow Diseases [1,3,5,8]		At design stage, redesign the work to limit the use of silica products and the amount of cuts etc. required [7]	2	
		Use silica free abrasives to reduce the risks of blasting [7]	2	
		Enclose the work area where possible to prevent dust escaping [7]	3	
		Limit the number of people near the work [1,7]	3	
		Use shrouds or screens to contain flying abrasive [7,8]	4	
		Wet or vacuum blasting for abrasive pressure blasting [7]	4	
		Provide mechanical ventilation where required [7,8]	4	
		Use hand tools for cuts where possible [7,8]	4	
		Use on-tool extraction; a local exhaust [LEV] system that is fitted directly onto the tool [7,8]	4	
		Rotate the workers doing the task and alternate tasks during the shift [7]	5	
		Provide training on identification of silica dust and how employees can protect themselves [1,4,5,7]	5	
		Use water suppression [7,8]	5	
		Provide air monitoring to measure the overall amount of silica dust created on the worksite [1,7]	5	
		Provide health monitoring for all workers exposed to silica dust which may include lung function testing annually and other tests as directed by a health professional e.g. occupational health nurse or medical practitioner [1,2,3,5,7]	5	
USE PPE; fit test all workers with suitable respirator (P2 filter min); goggles, overalls and gloves [1,7,8]	6			

4. Dust from: Housekeeping

[Dry sweeping, pressurized air blowing of concrete and rock, slurry]

Potential Hazards and Harm	Initial Risk	Control Methods (Describe what will be done to control the risk)	Level of Control	Residual Risk
Silicosis COPD (Chronic Obstructive Pulmonary Disease) Lung Cancer Renal Disease Airflow Diseases [1,3,5,8]		Do not dry sweep [1,8]	1	
		Enclose the work area where possible to prevent dust escaping [7]	3	
		Limit the number of people near the work [1,7]	3	
		Use extraction vacuum with Hepa filtering to remove dust [1,8]	4	
		Provide covered shutes and skips where needed [7]	4	
		Rotate the workers doing the task [7]	5	
		Alternate tasks [1]	5	
		Provide training on identification of silica dust and how employees can protect themselves [1,4,5,7,8]	5	
		Ensure wash down facilities are available for workers to clean their hands and face [4,7,8]	5	
		Provide air monitoring to measure the overall amount of silica dust created on the worksite [1,7]	5	
		Provide health monitoring for all workers exposed to silica dust which may include lung function testing annually and other tests as directed by a health professional e.g. occupational health nurse or medical practitioner [1,2,3,5,7]	5	
		USE PPE; fit test all workers with suitable respirator (P2 filter min); goggles, overalls and gloves, waterproof boots [1,7,8]	6	



5. Dust from: Rock

[Chipping, hammering, drilling, rock crushing, loading, hauling, dumping of rock]

Potential Hazards and Harm	Initial Risk	Control Methods (Describe what will be done to control the risk)	Level of Control	Residual Risk
Silicosis COPD (Chronic Obstructive Pulmonary Disease) Lung Cancer Renal Disease Airflow Diseases [1,3,5,8]		At design stage, redesign the work to limit the use of silica products and the amount of cuts etc. required [7]	2	
		Enclose the work area where possible to prevent dust escaping [7]	3	
		Limit the number of people near the work [1,7]	3	
		Cover loads in transit to prevent spillage & use covered bins and chutes where possible [7]	3	
		Use a less powerful tool e.g. block splitter instead of a cut off saw [7]	4	
		Use on-tool extraction; a local exhaust [LEV] system that is fitted directly onto the tool [7,8]	4	
		Rotate the workers doing the task [7]	5	
		Alternate tasks [1]	5	
		Provide training on identification of silica dust and how employees can protect themselves [1,5,7,8]	5	
		Apply damping down techniques to large areas or water suppression [1,7,8]	5	
		Provide air monitoring to measure the overall amount of silica dust created on the worksite [1,7]	5	
		Provide health monitoring for all workers exposed to silica dust which may include lung function testing annually and other tests as directed by a health professional e.g. occupational health nurse or medical practitioner [1,2,3,5,7]	5	
		USE PPE; fit test all workers with suitable respirator (P2 filter min); goggles, overalls and gloves, waterproof boots [1,7,8]	6	

6. Environmental

[Slurry and dust]

Potential Hazards and Harm	Initial Risk	Control Methods (Describe what will be done to control the risk)	Level of Control	Residual Risk
Silicosis COPD (Chronic Obstructive Pulmonary Disease) Lung Cancer Renal Disease Airflow Diseases [1,3,5,8]		Use of "Polymer" soil stabiliser	3	
		Contain dust; Use vacuum systems and seal waist for disposal [8,10]	4	
		Use environmental socks on drains to filter dust and contaminants from waterways [10]	4	
		Damp down dust where possible to prevent dust travelling to other areas outside the work zone. This could be automated for areas that are unstaffed [8,10]	4/5	
		Use dust screening on all fencing to help prevent dust travelling outside work area [10]	5	
		Ensure wash down facilities are available for workers to clean their hands and face, especially prior to eating [4,7,8]	5	
		Wash down contaminated equipment on site so as not to transfer contaminates [8]	5	
		Provide air monitoring to measure the overall amount of silica dust created on the worksite [1,7]	5	
		USE PPE; fit test all workers with suitable respirator (P2 filter min); goggles, overalls and gloves, waterproof boots [1,7,8]	6	



PERSONAL PROTECTIVE EQUIPMENT



Figure 1: PPE; disposable P2 filter (for very low dust levels)



Figure 2: PPE; half-face respirator (for low to medium dust levels) [1]



Figure 3: PPE; full-face respirator (for medium dust levels) [1]



Figure 4: PPE; full-face powered respirator (for high dust levels or people with facial hair)



Figure 5: PPE and Controls; wall chasing using on-tool extraction [7]

HEALTH MONITORING



Figure 6: Monitoring; air monitoring

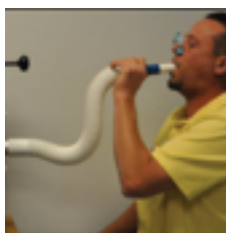


Figure 7: Monitoring; lung function testing

CONTROLS



Figure 8: Controls; water suppression on a cut-off saw [7]



Figure 9: Controls; damping down demolition sites

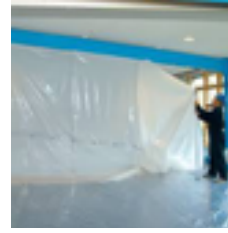


Figure 10: Controls; screening off areas from other workers

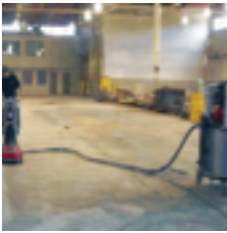


Figure 11: Controls; vacuum assisted power tools



Figure 12: Controls; local dust extraction

ENVIRONMENTAL CONTROLS



Figure 13: Environmental controls; filter socks



Figure 14: Environmental controls; filter socks



Figure 15: Environmental controls; filter screens



Figure 16: Environmental controls; cut zone filter screens



Figure 17: Environmental controls; site fencing filter wrap

WHAT DOES THE HEALTH AND SAFETY AT WORK ACT SAY ABOUT DUST?

Part 2 of the new Act is the most applicable to the dust work we are doing in the forum. In particular, Section 30, Management of Risks, 36 Primary Duty of Care, 37 Duty of PCBU who Manages or Controls Place of Work - it's important to note all PCBUs on a site need to consult with each other.

Health monitoring:

Section 36 (3) (g) of HSW Act 2016 – note this replaces Section 10 of the HSE Act 1992 - <http://www.legislation.govt.nz/act/public/2015/0070/latest/DLM5976895.html>

That the health of workers and the conditions at the workplace are monitored for the purpose of preventing injury or illness of workers arising from the conduct of the business or undertaking.

The Regulations are what PCBUs need to take note of in relation to dust. They must manage substances hazardous to health – and dust is one of them. The new Act is much clearer about the health monitoring requirements for workers. I've pulled out the key headings from the Regulations. The majority of this is new. The Regulations includes fines.

HEALTH AND SAFETY AT WORK ACT

General Risk and Workplace Management Regulations 2016

Part 2 Substances Hazardous to Health

Section 28 Managing risks associated with substances hazardous to health – for more information [click here](#)

Section 29 Ensuring prescribed exposure standards for substances hazardous to health are not exceeded – for more information [click here](#)

Section 30 When exposure monitoring required – keeping in mind that WorkSafe NZ has a control-based approach and will not routinely ask for workplace exposure monitoring/assessments – can be found [here](#)

Section 31 When health monitoring required – for more information [click here](#)

Part 3 Duties Relating to Exposure Monitoring and Health Monitoring

EXPOSURE MONITORING

Section 32 Duties relating to exposure monitoring - PCBU duties - can be found [here](#)

HEALTH MONITORING

Section 33 Duty to inform worker of health monitoring – consent still needed - for more information [click here](#)

Section 34 Duty to ensure appropriate health monitoring is provided – should be done by a medical practitioner, registered nurse or nurse practitioner. This is not always current practice – some employers are using technicians and audiology clinics. - for more information [click here](#)

Section 35 Duty to ensure health monitoring is supervised - for more information [click here](#)

Section 36 Duty to pay costs of health monitoring – states responsibility of PCBU very clearly - for more information [click here](#)

Section 37 Information that must be provided to occupational health practitioner - can be found [here](#)

Section 38 Duty to obtain health monitoring report – states what PCBUs must see in a report and what they must do with it. Talks about following up on recommendations - for more information [click here](#)

Section 39 Duty to give health monitoring report to worker - can be found [here](#)

Section 40 Duty to give health monitoring report to relevant PCBUs – with worker consent - for more information [click here](#)

Section 41 Duty to give health monitoring report to regulator – with worker consent - for more information [click here](#)

Section 42 Health monitoring records – must keep for 30 years and 40 years for asbestos-related records - for more information [click here](#)



GLOSSARY

Airflow diseases	Blocks movement of air in and out of lungs: 1. Bronchitis 2. Asthma 3. Emphysema [3]
Chronic Obstructive Pulmonary Disease [COPD]	COPD refers to a chronic lung condition that can result from breathing in silica dust. It can lead to breathing difficulties.
Health Monitoring	This is occupational testing and generally consists of hearing, lung function, grip and vision. Workers should also undertake medical screening for exposure to toxins, including blood testing – refer to your health professional for guidance. [4]
Lung Cancer	If a worker has a lengthy exposure to high levels of silica dust, lung cancer may develop. Once silicosis has been diagnosed, the risk of lung cancer increases.
PPE	When selecting PPE, look for suitable items for controlling dust e.g. clothing that does not keep hold of dust [4]. Refer to AS/NZS 1715 and 1716 for the correct fitting of Respirators [6]
Renal Disease	Kidneys – there is epidemiologic data emerging that silica causes renal disease. [2] Healthy kidneys work like a cars oil filter. They remove waste materials from your blood and the rest of your body. When you have kidney disease, extra waste builds up in your blood. This waste poisons your body. [3]
Risk Matrix	Risk Matrix: matrix used during risk assessment to define the various levels of risk using a probability and severity risk rating. This mechanism is used to increase visibility of risks and assist management’s decision-making. The risk-rating table used for this register is an example only and is intended to improve understanding of the risks associated with dust in construction. For completeness your business should overlay its own risk-rating table to the risk assessment.
Silicosis	Breathing in silica dust can cause the lung tissue to scar, a condition referred to as silicosis. This scarring results in a loss of lung function, usually characterised by breathlessness. The effects of silicosis are permanent and may continue to develop even after exposure has stopped. [1]
Silicosis Classifications	1. Chronic: Occurs after 10 or more years of exposure – swelling in lungs, troubled breathing similar to COPD [3] 2. Accelerated: Develops in 5 to 10 years; symptoms occur faster than in chronic silicosis [3] 3. Acute: Develops in less than 5 years, lungs become inflamed and fill with fluid, severe shortness of breath and low blood oxygen [3]

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